
Clock Controller maintenance

Tracking mode

In tracking mode, the PRI loop supplies an external clock reference to a Clock Controller. See Figure 17. Two PRI loops can operate in tracking mode, with one defined as the primary reference source for clock synchronization, the other defined as the secondary reference source. The secondary reference acts as a backup to the primary reference.

As shown in Figure 17, a Meridian 1 system with dual CPUs may have two Clock Controllers (CC0 and CC1). One Clock Controller acts as a backup to the other. The Clock Controllers should be completely locked to the reference clock.

Free run (non-tracking) mode

The clock synchronization for a PRI loop may operate in free run mode if the following occurs:

- the loop is not defined as the primary or secondary clock reference
- the primary and secondary references are disabled
- the primary and secondary references are in red alarm (local alarm)

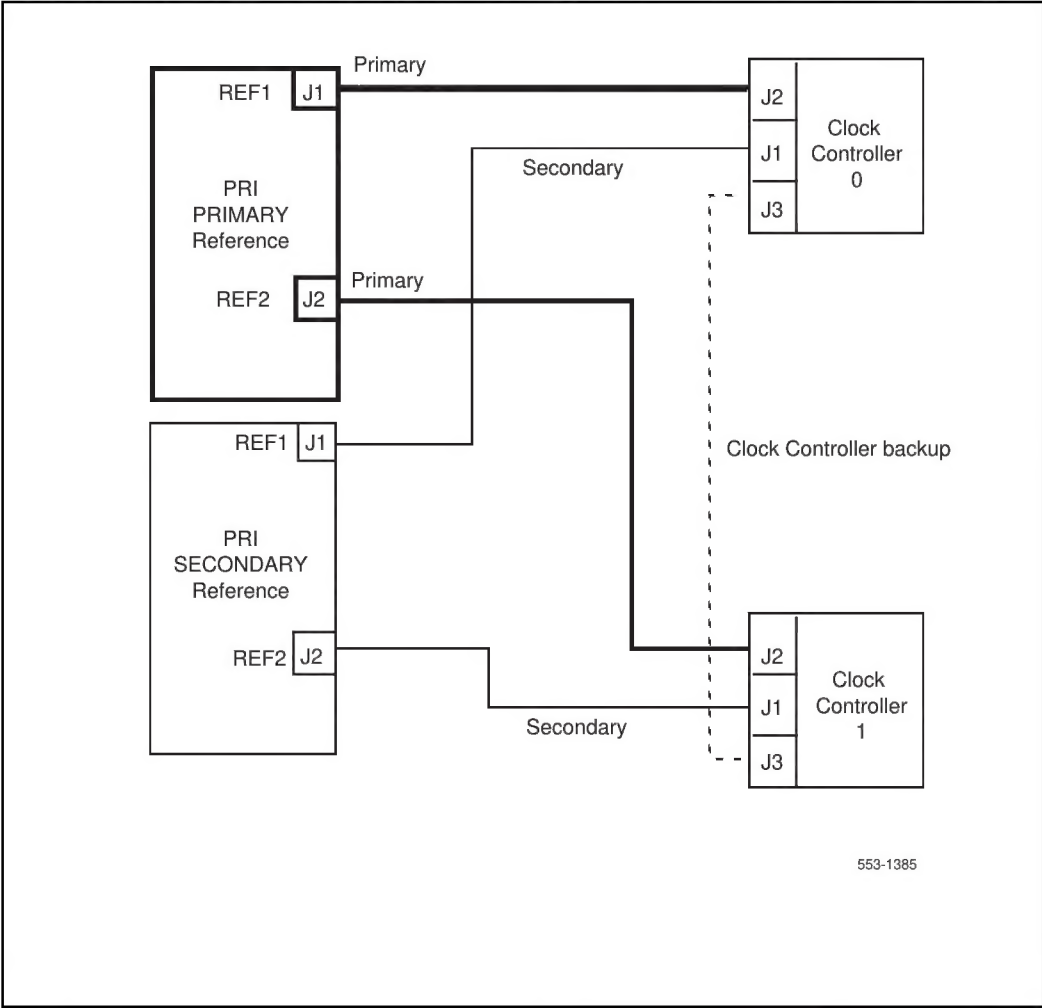
Reference clock errors

Meridian 1 software checks every 15 minutes to see if a Clock Controller or reference clock error has occurred.

In tracking mode, at any one time, there is one active Clock Controller tracking on one reference clock. If a Clock Controller error is detected, the system switches to the backup Clock Controller, without affecting which reference clock is being tracked.

A reference clock error occurs when there is a problem with the clock driver or with the reference system clock at the far end. If the Clock Controller detects a reference clock error, the reference clocks are switched.

Figure 17
Clock controller primary and secondary tracking



Automatic clock recovery

An option for automatic clock recovery can be selected in LD60 with the command EREF.

A PRI loop is disabled when it enters a red alarm (local alarm) condition. If the red alarm is cleared, the loop is enabled automatically. When the loop is enabled, clock tracking is restored in the following conditions:

- If the loop is assigned as the primary reference clock, but the Clock Controller is tracking on the secondary reference or in free run mode, the clock is restored to tracking on primary.
- If the loop is assigned as the secondary reference clock but the Clock Controller is in free run mode, it is restored to tracking on secondary.

If the 15-minute clock check indicates the system is in free run mode the following occurs:

- Tracking is restored to the primary reference clock, if defined.
- If the primary reference is disabled or in red alarm (local alarm), tracking is restored to the secondary reference clock, if defined.

Note: If the system is put into free run mode intentionally by the craftsperson, it resumes tracking on a reference clock at this time. This occurs unless the clock-switching option has been disabled (LD60, command MREF), or the reference clock has been “undefined” in the database.

Automatic clock switching

If the EREF option is selected in LD60, tracking on the primary or secondary reference clock is automatically switched in the following manner:

- If software is unable to track on the assigned primary reference clock, it switches to the secondary reference clock and sends appropriate DTC maintenance messages.
- If software is unable to track on the assigned secondary reference clock, it switches to free run mode.

QPC471, QPC775 Clock Controller Card

Clock Controller switch settings

Switch settings for the QPC471 Clock Controller (vintages A, B, C, E, F, and G) and the QPC775 Clock Controller (currently available in Canada only) are given in Table 12. Switch settings for the QPC471 Clock Controller vintage H are given in Table 13.

Table 12
Clock Controller switch settings

System/Clock Controller	SW1	SW2	SW3	SW4 (1,2)	Jumper 1	Jumper 2
QPC471 A						
N, NT, RT	n/a	ON	n/a	n/a	n/a	n/a
XN, XT	n/a	OFF	n/a	n/a	n/a	n/a
QPC471 B through G						
ST, STE, 21, 21A, 21E	ON	OFF	n/a	n/a	TP8-TP9	TP11-TP12
MS	ON	ON	n/a	n/a	TP9-TP10	TP12-TP13
N, NT, RT, 51, 61	ON	OFF	n/a	n/a	TP8-TP9	TP11-TP12
XN, XT, 71	OFF	OFF	n/a	n/a	TP8-TP9	TP11-TP12
QPC775						
N, NT, RT, ST, STE, 21, 21A, 21E, 51, 61	n/a	ON	OFF	ON	n/a	n/a
MS, SN	n/a	ON	ON	OFF	n/a	n/a
XN, XT, 71, 81	n/a	OFF	OFF	ON	n/a	n/a

Table 13
Clock Controller switch settings for QPC471 vintage H

System	SW1	SW2	SW4
ST, STE, 21, 21A, 21E	on on on on	off off off off	off off off off
MS, SN	on on on on	on on on on	off off off off
N, NT, RT, 51, 61	on on on on	off off off off	off on * *
XN, XT, 71, 81	off off off off	off off off off	off on * *
Cable length between the J3 faceplate connectors:			
0-4.3 m (0-14 ft)			off off
4.6-6.1 m (15-50 ft)			off on
6.4-10.1 m (21-33 ft)			on off
10.4-15.2 m (34-50 ft)			on on
* If there is only one Clock Controller card in the system, set to OFF. If there are two Clock Controller cards, set to the value determined by the cable length between the J3 faceplate connectors. Determine the total cable length (no single cable can exceed 25 ft) between the J# connectors. Both cards must have the same setting.			

Replacing a Clock Controller card

Use this procedure to replace a Clock Controller (CC) card.

Note: The QPC775 Clock Controller is used in Canadian and International applications. QPC775 and QPC471 cards may not be combined in one system.

When using the QPC471 Clock Controller, vintage H must be used with option 81 systems.

Refer to *X11 input/output guide* (553-3001-400) for a description of all maintenance commands and system messages.

WARNING

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Disable the clock controller card:
 - The card you are removing must be inactive. To switch the clock, do the following:
LD 60
SWCK
 - Disable the clock controller card:

DIS CC x “x” is the card number—0 or 1
- 2 Set the ENB/DIS switch to DIS on the card you are removing.

CAUTION

To avoid interrupting service, set ENB/DIS switches to DIS before disconnecting or connecting cables.

- 3 Tag and disconnect cables to the card you are removing.
- 4 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set option switches on the replacement card the same as on the card you removed. To check switch settings, see *Circuit card installation and testing* (553-3001-211).
- 3 Insert the replacement card into the vacated slot and hook the locking devices.

- 4 Connect the cable to the replacement card.
- 5 Set the ENB/DIS switch to ENB on the replacement card.
- 6 Enable and test the card:

ENL CC x
SWCK

End the session in LD60:

If there is a problem, a DTC system message is generated and the red LED lights on the faceplate of the card.

- 7 Tag defective equipment with a description of the problem, and package it for return to a repair center.

